also have requested that new claims 65-88 be added. After entry of this amendment claims 1-2, 11-14, 18-22, 24-29, 33-35, 42-44, 46, 50-58 and 65-88 should be pending.

I. Drawings

The April 11, 2002, Office action objected to the drawings. Attached is Fig. 11 with applicants' proposed amendments indicated in red ink. Reference number 73 has been added to indicate the threaded rod mentioned on p. 22, line 15. Reference number 78 denoting the hole similar to hole 79 is extraneous and has been eliminated. No new matter has been added by applicants' requested amendments. Applicants respectfully request the Examiner's approval of the amended drawings.

II. Claim Rejections – 35 U.S.C. § 102

Claims 1-3, 11, 13, 14, 18-22, 24-29, 33-36, 42-44, 46 and 50-58 are rejected under 35 U.S.C. § 102 as allegedly being anticipated by U.S. Patent No. 5,932,940 (Epstein). Applicants traverse this rejection and request that it be withdrawn.

Applicants have amended each independent claim to recite additional features to further highlight distinctions between applicants' claimed embodiments and Epstein.

Applicants have amended independent claims 1 and 34 to recite eliminating the fixture bridge by applying an electric current across the fixture bridge. Epstein does not expressly state using an electric current to eliminate the fixture bridge, but instead relies on a trench etch process to release the disks (col. 55, line 30) and rotors (col. 56, line 20). Because Epstein does not disclose releasing a fixture bridge by applying an electrical current, claims 1 and 34 are not anticipated by Epstein.

Furthermore, Epstein also does not render obvious claims 1 and 34. While Epstein does provide a list of potentially applicable machining processes, including electro-discharge milling, these processes are not specifically associated with the removal of fixture bridges. See Epstein, col. 58, lines 38-42. Electro-discharge milling is incompatible with the removal of any structures on the devices described in Epstein's specification. First, electro-discharge milling works best with materials of high conductivity. The refractory ceramics, such as silicon and silicon carbide, which make up all, or at the very least, the bulk of Epstein's devices, are not as conductive as metals. Second, in order to be reasonably selective, electro-discharge milling must be applied to

well-defined conductive channels between well-defined electrodes. Such channels and electrodes are not described in Epstein's specification and the incorporation of such features into Epstein's device would not be obvious to one skilled in the art. Epstein even admits, after listing the machining processes, that "many of the geometries and tolerances in the microcomponentry designs are more preferably produced by a microfabrication process." See Epstein, col. 58, lines 42-44.

Finally, applicants' claims refer to applying an electrical current (certain claims state "applying an electrical potential") **across** the fixture bridge. Applicants assert that Epstein does not teach or suggest using electro-discharge milling to remove a fixture bridge. Even if, solely for sake of argument, Epstein does teach removing a fixture bridge by electro-discharge milling, Epstein does not teach applying a current or potential **across** the bridge. This is because electro-discharge milling works by creating a potential between a mandrel and the article itself, not across the fixture bridge. This points to a further distinction between certain embodiments of applicants' invention, e.g., such as the embodiment recited in claim 28, relative to Epstein. Assuming Epstein were to attempt to remove a fixture bridge by electro-discharge milling, the mandrel must be brought into sufficiently close physical proximity to the fixture bridge to allow an arc from the mandrel to a portion of the fixture bridge. This requires that the fixture bridge be on an exterior portion of the device. This is not required for applicants' invention, as an electric current can be established across a fixture bridge simply by contacting the overall structure with an electrode. Applicants' invention therefore provides a significant advantage for eliminating fixture bridges located in an interior portion of a device. This is a feature which Epstein cannot achieve, even assuming *arguendo* that Epstein teaches using electro-discharge milling to eliminate fixture bridges.

Applicants' have requested that claim 28 be amended to recite the elimination of fixture bridges on internal laminae. Trench etching only works on exposed features. In contrast, applicants' method may be used to remove fixture bridges on internal laminae. See p. 21, lines 10-14 of applicants' specification. Again, this provides a significant practical advantage over known processes, such as Epstein, because several internal laminae can be processed simultaneously and the independent structures are held in their proper positions by adjacent materials.

Applicant's newly added claims 73 and 87 recite a fixture bridge made from a non-refractory material. This is not taught or suggested by Epstein. Instead, the use of a refractory ceramic or another refractory microelectronic material is essential to Epstein. Throughout Epstein these materials are cited as the preferred materials of construction. See, for example, Epstein col 11, lines 25-26; col. 12, lines 1-64. Even the alternative materials cited by Epstein are limited to refractory metals and refractory metal alloys as well as intermetallic compounds. See Epstein, col. 13, lines 6-14. And, as currently understood, Epstein does not teach using bulk refractory metal as with certain embodiments of applicants' invention. Rather, Epstein teaches applying such compounds, such as by CVD, as thin coatings for other materials of choice taught by Epstein, such as a refractory ceramic or other refractory microelectronic material. Refractory materials are characterized by their extremely high boiling points. This property is integral to the function of the devices described by Epstein. For instance, Epstein states that the ability of silicon carbide and silicon nitride to withstand high operating temperatures eliminates the need for combustor wall cooling. See Epstein, col. 34, lines 7-16. The extremely high boiling points of these materials, the same feature extolled by Epstein, also makes fixture bridges made from such materials particularly ill suited for elimination by electrical current.

Although Epstein often states that the devices it describes can be made of a variety of alternative materials, the methods of fabrication described by Epstein actually only work on a narrow range of refractory ceramics. All of Epstein's processes rely to some extent on trench etching of silicon wafers. Epstein even acknowledges that trench etching is not practical on other refractory materials suggested in the patent, including silicon carbide. See Epstein, col. 57, lines 12-26. For such materials, Epstein briefly contemplates depositing the materials into molds of patterned silicon by means of a CVD process. See Epstein, col. 57, lines 26-37. This is not practical. Considering that Epstein's processing steps are generally incompatible with non-refractory materials, it would not be obvious to one skilled in the art to employ such materials in conjunction with any of the processing steps suggested by Epstein.

III. Claim Rejections – 35 U.S.C. § 103

Claim 12 was rejected as allegedly being obvious over Epstein under 35 U.S.C. § 103 in view of U.S. Patent No. 4,647,748 (Glassman). Applicants traverse this rejection and request that it be withdrawn.

Claim 12 depends from claim 1 and is allowable over Epstein for the reasons stated above for claim 1. Glassman does not provide the features of applicants' claims that are not taught or suggested by Epstein. For example, Glassman teaches using carbon-tipped electrodes for electro discharge milling. As discussed above, the materials taught by Epstein generally are not sufficiently conductive to be used in electro discharge milling processes. Therefore, there is no suggestion to combine the teachings of Glassman with the teachings of Epstein.

IV. Dependent Claims

All rejected dependent claims depend from a rejected independent claim and are allowable for the reasons stated for each independent claim. Each of the dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, dependent claims 27 and 58 and newly added dependent claim 86 refer to the production of meso-scale devices. Applicants submit that Epstein teaches away from application of its techniques to the production of meso-scale devices. Epstein cites production in the micro-size realm as the primary way to overcome the limitations caused by the brittleness of refractory materials. See Epstein, col. 12, lines 35-45. This suggests to those of ordinary skill in the art that constructing larger sized devices with Epstein's processes would not be practical, and may not be possible. Since applicants are not limited to using brittle refractory ceramics, applicants may produce larger devices without encountering the material limitations discussed by Epstein. Indeed, applicants' preferred embodiment is primarily focused on the production of meso-scale and larger devices.

V. Objected-To Claims

Claims 15-17 and 47-49 were objected to as being dependent on a rejected base claim. While applicants disagree with the rejection of the underlying independent claims, applicants do agree that the objected-to claims are allowable in independent form. Applicants have cancelled claims 15-17 and 47-49 without prejudice and have rewritten claims 15 and 47 in independent form as new independent claims 65 and 70 as suggested by the Examiner. Claims 16 and 17 were rewritten as depending on newly added independent claim 65. Claims 48 and 49 were rewritten as depending on newly added independent claim 68.

VI. New Claims

In addition to the independent versions of the objected-to claims, applicants have added several other new claims. Newly added independent claim 73 recites a fixture bridge made of a non-refractory material. This claim is supported by applicants' specification on p. 8, lines 10-17. Since Epstein does not teach the application of its processes to materials other than refractory ceramics, as discussed above, this claim is not anticipated or made obvious by Epstein.

Newly added independent claim 86 recites internal laminae, fixture bridge(s) made of a non-refractory material and the elimination of fixture bridge(s) by the application of electrical current. None of these features is taught or suggested by Epstein as discussed above, and hence the combination of these features cannot be taught or suggested by Epstein, or Epstein in combination with Glassman.

VII. Conclusion

For the above set out reasons, it is respectfully submitted that all of the claims now in the application define over the cited prior art, are neither anticipated nor made obvious by the prior art, and should be allowable. A Notice of Allowance is respectfully requested.

Respectfully submitted,
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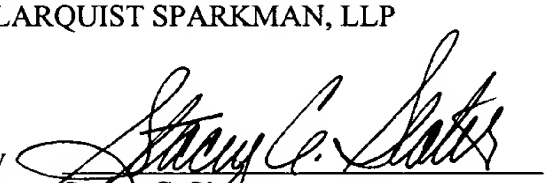
By 
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Marked-up Version of Amended Claims
Pursuant to 37 C.F.R. §§ 1.121(b)-(c)

1. (Amended) A method for making a device or a component of a device, comprising:

providing plural laminae that coupled together collectively define a monolithic device or a component of a device, at least one of the lamina having at least one structure, at least one substructure, and at least one fixture bridge, the structure and the substructure defining a space therebetween, and further with the substructure being coupled to the structure by the fixture bridge across the space; and

dissociating the substructure by applying an electrical current across the fixture bridge sufficient to eliminate [eliminating] the fixture bridge.

28. (Amended) A method for making a micro- or meso-scale device or a component of such a device comprising:

providing three or more [plural] laminae that coupled together collectively define a [preassembled] device or a component of a device[, at least one of the lamina having a structure and at least one substructure coupled to the structure or another substructure by at least one fixture bridge];

registering the [plural] laminae to define at least one internal lamina, positioned between a first and a second lamina, the at least one internal lamina having a structure and at least one substructure coupled to the structure or another substructure by at least one fixture bridge;

bonding the laminae one to another to form a monolithic device or a component of a device; and

eliminating the fixture bridge prior or subsequent to bonding the laminae.

34. (Twice amended) A method for making an array of devices or an array of components of devices, comprising:

providing plural laminae where at least one of the plural lamina has an array of at least two assemblies, each assembly in the array comprising at least one structure, at least one substructure, and at least one fixture bridge, such that at least one of the structures and at least one of the substructures define a space therebetween, and at least one substructure is coupled to at least one structure by at least one fixture bridge across the space; and

dissociating at least one substructure from the structure to which it is coupled by applying an electrical current across the fixture bridge sufficient to eliminate [eliminating] the fixture bridge, thereby making an array of devices or an array of components of devices.